



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,730	10/25/2000	Oguz Tanrikulu	2376.2001-000	3000

21005 7590 09/08/2003

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.  
530 VIRGINIA ROAD  
P.O. BOX 9133  
CONCORD, MA 01742-9133

EXAMINER

HAROLD, JEFFEREY F

ART UNIT PAPER NUMBER

2644

DATE MAILED: 09/08/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/696,730

Applicant(s)

TANRIKULU ET AL.

Examiner

Jefferey F. Harold

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,12-17,19-21,23-29,31-34,36-38,40,42,43,45,46,48 and 49 is/are rejected.
- 7) ☒ Claim(s) 2,8-11,18,22,30,35,39,41,44,47 and 50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. ***Claims 1, 6, 12-17, 20, 23, 25, 32, 34, 37***, are rejected under 35 U.S.C. 102(b) as being anticipated by Canniff et al. (United States Patent 5,619,564), hereinafter referenced as Canniff.

Regarding **claim 1**, it is interpreted and thus rejected for the same reasons set forth in the rejection of claim 17. Since claim 1 and disclose a method that corresponds to the apparatus of claims 17 and, the method is inherent in that it simply provides functionality for the structural implementation found in claim 1.

Regarding **claim 6**, Canniff discloses everything claimed as applied above (see claim 1), in addition Canniff discloses filtering the subbands with at least one bank of filters, BPF 1-4, corresponding to the number of possible frequencies of sinusoids within the respective subbands, as discloses at column 3, lines 51- 62 and exhibited in figure 1.

Regarding **claim 12**, Canniff discloses everything claimed as applied above (see claim 1), in addition, Canniff discloses wherein analyzing the energies consists of determining whether a summing of the energies is the subbands exceeds a minimum threshold level, as disclosed at column 4, line 32 through column 5, line 13 and exhibited in figures 1 and 2.

Regarding **claim 13**, Canniff discloses everything claimed as applied above (see claim 1), in addition, Canniff discloses wherein analyzing the energies comprises

determining whether a difference between the energies in the subbands is below a twist-test threshold, as disclosed at column 2, line 59 through column 3, line 16.

Regarding **claim 15**, Canniff discloses everything claimed as applied above (see claim 1), in addition Canniff discloses reporting valid dialed digits, as disclosed at column 5, lines 14-25.

Regarding **claim 16**, Canniff discloses everything claimed as applied above (see claim 1), in addition claim 16 is interpreted and thus rejected for the reasons set forth in the rejection of claim 23.

Regarding **claim 17**, Canniff a tone detector with improved performance in the presence of speech. In addition, Canniff discloses a high tone band elimination filter (16) and a low tone band elimination filter (18), which read on claimed "splitter to separate an electrical signal, including sinusoids corresponding to frequencies of dialed digits", further separating the signal via BPF 1-8, which reads on claimed "subbands" which are sampled at a sampling frequency of about a highest frequency of the sinusoids via down-sampling circuit (32), as discloses at column 3, line 16 through column 4, line 19 and exhibited in figure 1;

the amplitude detectors (34, 36, 38,... 48), which read on claimed "analyzer" measure energies within the subbands to determine a presence of the sinusoids, as disclosed at column 4, lines 20-32 and exhibited in figure 1.

Regarding **claim 20**, Canniff discloses everything claimed as applied above (see claim 17), in addition Canniff discloses one bank of filters, BPF 1-4 to filter the subbands, the bank of filters comprising filter corresponding to the number of possible

frequencies of sinusoids within the respective subbands, as discloses at column 3, lines 51- 62 and exhibited in figure 1.

Regarding **claim 23**, Canniff discloses everything claimed as applied above (see claim 17), in addition Canniff discloses wherein the electrical signal is sampled by an inherent analog to digital converter and the splitter and analyzer are implemented in digital processor instructions and executed by a digital processor, as discloses at column 7, lines 3-30 and exhibited in figure 4.

Regarding **claim 25**, it is interpreted and thus rejected for the reasons set forth above in the rejection of claims 17 and 23.

Regarding **claims 32, 34, 37**, they are interpreted and thus rejected for the reasons set forth above in the rejection of claims 1, 17, and 20.

Regarding **claim 42**, Canniff discloses everything claimed as applied above (see claim 1), in addition Canniff discloses wherein splitting the electrical signal is performed at about the highest frequency of the sinusoid, as disclosed at column 3, lines 31-50.

Regarding **claim 43**, Canniff discloses everything claimed as applied above (see claim 1), in addition Canniff discloses wherein analyzing the energies is performed at about the highest frequency of the sinusoid, as disclosed at column 4, line 20 through column 5, line 25.

Regarding claims 45, 48 and 51, they are interpreted and thus rejected for the reasons set forth above in the rejection of claim 42.

Regarding claims 46, 49 and 52, they are interpreted and thus rejected for the reasons set forth above in the rejection of claim 43.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. ***Claims 3-5 and 19-22, 27 and 36***, are rejected under 35 U.S.C. 103(a) as being unpatentable over Canniff in view of applicant's admitted prior art.

Regarding **claim 3**, Canniff discloses everything claimed as applied above (see claim 1), however Canniff fails to disclose filtering the electrical signal using a power symmetric infinite impulse response filter. However, the examiner maintains that it was well known in the art to provide filtering the electrical signal using a power symmetric infinite impulse response filter, as taught by applicant's admitted prior.

In addition, applicant's admitted prior art, "Design and Discrete Re-optimization of All-pass Based Power Symmetric IIR Filters" discloses highly selective low-pass power symmetric IIR filters which are well suited of sub-band decomposition in applications such as acoustic echo cancellation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Canniff by specifically providing filtering the electrical signal using a power symmetric infinite impulse response filter, as taught by applicant's admitted prior art, for the purpose of reduced computational complexity.

Regarding **claim 4**, Canniff and applicant's admitted prior art, the combination, disclose everything claimed as applied above (see claim 3), however the combination

fails to disclose implementation in polyphase form. However, the examiner maintains that it was well known in the art to provide implementation in a polyphase form, as taught by applicant's admitted prior.

In addition, applicant's admitted prior art, "Adaptive Signal Processing Algorithms with Accelerated Convergence and Noise Immunity" discloses analysis and synthesis blocks of all-pass polyphase networks.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing implementation in polyphase form, as taught by applicant's admitted prior art, for the purpose of reduced computational complexity.

Regarding **claim 5**, Canniff and applicant's admitted prior art, the combination, disclose everything claimed as applied above (see claim 3), however the combination fails to disclose all-pass sections implemented in compact realizations. However, the examiner maintains that it was well known in the art to all-pass sections implemented in compact realizations, as taught by applicant's admitted prior.

In addition, applicant's admitted prior art, "Digital All-Pass Networks" discloses all-pass section implemented in various realization.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing all-pass sections implemented in compact realizations, as taught by applicant's admitted prior art, for the purpose of reduced computational complexity.

Regarding **claims 19, 27 and 36**, they are interpreted and thus rejected for the reasons set forth above in the rejection of claims 1-14

3. **Claims 7, 14, 21, 24, 29, 31, 33 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Canniff in view of well know prior art (MPEP 2144.03).

Regarding **claim 7**, Canniff discloses everything claimed as applied above (see claim 6), however, Canniff fails to disclose notch filters. However, the examiner takes official notice of the fact that it was well know in the art to provide notch filters.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Canniff by specifically providing notch filters, for the purpose of blocking a specific band.

Regarding **claim 14**, Canniff discloses everything claimed as applied above (see claim 1), in addition, claim 14 in interpreted and thus rejected for the reasons set forth above in the rejection of claims 7 and 12.

Regarding **claim 21**, Canniff discloses everything claimed as applied above (see claim 17), in addition, claim 21 in interpreted and thus rejected for the reasons set forth above in the rejection of claims 7.

Regarding **claim 24**, Canniff discloses everything claimed as applied above (see claim 17), however, Canniff fails to disclose a device supporting voice over IP. However, the examiner takes official notice of the fact that it was well know in the art to provide a device supporting voice over IP.



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Canniff by specifically providing a device for supporting voice over IP, for the purpose of processing voice data over a data network using internet protocol.

Regarding **claims 29, 31, 33 and 40**, they are interpreted and thus rejected for the reasons set forth above in the rejection of claims 1-16 and 24.

***Allowable Subject Matter***

4. **Claims 2, 8-11, 22, 30, 35, 39, 41, 44, 47, and 50** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding **claims 2, 18, 35**, the prior art of record failed to disclose or fairly suggest wherein the separating the electrical signal into the subbands comprises extracting subbands of 0-1 kHz and 1-2 kHz.

Regarding **claim 8**, the prior art of record failed to disclose or fairly suggest wherein splitting the electrical signal consists of extracting a 0-1 kHz subband and a 1-2 kHz subband and filtering the subbands with four notch filters per bank of filters.

Regarding **claim 9**, the prior art of record failed to disclose or fairly suggest wherein, for MF-R1 detection, splitting the electrical signal consists of extracting a 0-1

kHz subband and a 1-2 kHz subband and filtering the subbands with four notch filters per bank of filters.

Regarding **claim 10**, the prior art of record failed to disclose or fairly suggest wherein, for MF-R1 detection, splitting the electrical signal consists of extracting a 0-1 kHz subband and a 1-2 kHz subband and filtering the subbands with six notch filters per bank of filters; and for backward detection, splitting the electrical signal consist of extracting a 0-1 kHz subband and a 1-2 kHz subband and filtering the 0-1kHz subband with a notch filter at 980 Hz, to remove aliasing of the 1020Hz tone in the 1-2 kHz subband, and four other notch filters and the 1-2kHz subband with two notch filters.

Regarding **claim 11**, the prior art of record failed to disclose or fairly suggest preclassifying the sinusoids in the subbands and selecting within the respective banks of filters the match frequencies of the preclassified sinusoids.

Regarding **claim 22**, the prior art of record failed to disclose or fairly suggest at least one preclassifying to determine the sinusoids in the subbands and to select filters within respective banks of filters the match frequencies of the sinusoids.

Regarding **claims 30 and 39**, the prior art of record failed to disclose or fairly suggest preclassifying the sinusoids in the subbands and selecting within the respective banks of filters that match frequencies of the preclassified sinusoids.

Regarding **claims 41, 44, 47, and 50**, the prior art of record failed to disclose or fairly suggest wherein the sampling frequency is about 2kHz.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jefferey F. Harold whose telephone number is (703) 306-5836. The examiner can normally be reached on Monday-Friday 7:30am-4pm.

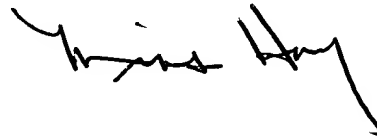
Art Unit: 2644

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



JFH  
August 28, 2003



**MINSUN OH HARVEY  
PRIMARY EXAMINER**